

10.0 OTHER CONSIDERATIONS

10.1 Consideration of Magnuson-Stevens Act Section 304 (g) Measures and National Standards

10.1.1 Evaluation of Possible Disadvantage to U.S. Fishermen in Relation to Foreign Competitors

In 1996, the United States supported a U.N. agreement¹ concerning highly migratory fish stocks which requires the use of the precautionary approach in fisheries management. The agreement requires nations to “minimize pollution, waste, discards, catch by lost or abandoned gear, catch of non-target species,...[and] to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques.” The action regarding the use of frozen bait promotes the use of more selective gear types (e.g., gear modifications to reduce bycatch) and the closed areas should help reduce waste and discards.

NMFS continues to pursue, through international entities, comparable international management measures with respect to fishing for highly migratory species and incidental catch reduction. At the 1998 ICCAT meeting, SCRS was tasked with developing rebuilding schedules for swordfish for 5, 10, and 15 years. The 1999 swordfish stock assessment included that information (SCRS, 1999) and NMFS prepared a foundation for negotiation of a ten-year rebuilding plan based on the results of the assessment. In 1999, the United States and other ICCAT fishing member nations agreed to a rebuilding plan for North Atlantic swordfish. This rebuilding plan sets landings quotas and requires member nations to reduce swordfish discards. Country catch allocations include a swordfish dead discard allowance that is phased out by 2004.

The effort to achieve stock conservation through multilateral efforts help to minimize any disadvantage to U.S. fishermen in relation to foreign competitors.

10.1.2 Provide U.S. Fishing Vessels Reasonable Opportunity to Harvest Quota

The final actions of this regulation will not prevent U.S. commercial fishermen from landing the quotas allocated to them. These regulations close areas and times only to fishermen fishing with pelagic longline gear. Fishermen who wish to continue to fish with pelagic longline gear may still do so outside the closed areas and times. Fishermen who do not fish with pelagic longline gear are not affected by these regulations. It is fully expected that the full quota of swordfish allocated to the United States will be taken by vessels using other gear or fishing in other areas.

¹The Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.

As of March 23, 2000, there were 450 fishermen who had qualified for a directed or incidental swordfish limited access permit. These permit holders are also required to hold a shark limited access permit and a tuna longline category permit. Of these 450 permit holders, only 208 reported landings of any species in the pelagic logbook in 1998. In addition, as of March 23, 2000, there were 123 fishermen who were issued swordfish handgear limited access permits. These data indicate that there is still an opportunity for fishermen with permits to increase effort in HMS fisheries.

10.1.3 Pursue Comparable International Fishery Management Measures

ICCAT has requested that SCRS evaluate alternatives to minimum sizes as a means to reduce undersized swordfish mortality. One option is the use of time/area closures similar to the area closure that ICCAT recommended for reducing catches of undersized bigeye tuna. Figure 10.1 shows the distribution of catches of undersized swordfish by quarter and fishing area. These data could be analyzed by fishing nations to identify areas and times that might be closed to protect undersized swordfish. In addition, the United States sponsored a resolution at ICCAT in 1999 calling for SCRS to study whether gear modifications could reduce undersized swordfish catch by pelagic longline gear.

Area closures may be pursued through ICCAT in order to reduce incidental catch of unwanted HMS and protected resources. It is likely that the United States will consider such time/area closures in this international context and will support such measures, if practicable, at ICCAT. The United States has supported development of a VMS program through ICCAT which may be a precursor to implementing international time/area closures. In addition, NMFS is pursuing rebuilding plans for all ICCAT-managed species and strongly supports compliance measures against fishing nations (member and non-member nations) that do not fish consistent with ICCAT conservation and management measures (e.g., trade sanctions).

10.1.4 Consider Traditional Fishing Patterns and the Operating Requirements of the Fisheries

In the late 1800s, commercial fishermen in New England were pursuing swordfish, primarily with harpoons and targeting the large swordfish then available in surface waters. Pelagic longline fishing, both domestic and international, began in earnest in the North Atlantic Ocean in the early 1960s. The introduction of this gear enabled access to swordfish in deeper waters and opened new fishing areas. U.S. pelagic longline vessels follow the fish throughout their migratory range along the East Coast of the United States and up to the Grand Banks, and now catch approximately 98 percent of the U.S. Atlantic swordfish landings. To the extent that the time/area closures will prevent fishermen who use pelagic longline gear from fishing in three closed areas off the southeast coastal areas and Gulf of Mexico and eliminate the use of live bait in the Gulf of Mexico, the final actions will alter traditional fishing patterns. However, NMFS considered this and reduced the time/area closures in the final rule partly to minimize this effect. Many of the smaller vessels that will be affected by the final actions are not able to operate far

closure is justified under NS 4 as a conservation measure with no discriminatory intent. In addition, many fishermen already fish in waters adjacent to a number of states both inside and outside the closed areas. The live bait prohibition in the Gulf of Mexico will impact only fishermen in the Gulf of Mexico and is a conservation measure with no discriminatory intent. In terms of efficiency, one could argue that a time/area closure allows for more efficient harvesting of the stock than gear modifications which might satisfy the same objectives with less economic impact but could reduce efficiency (NS 5). However, too many time/area closures could reduce the efficiency if fishermen spend a lot of time in transit to the open areas. Thus, NMFS chose to use the live bait prohibition (a gear use restriction) as opposed to both a western Gulf of Mexico closure and the DeSoto closure to minimize the economic impacts on fishermen while still achieving the conservation goals of the HMS FMP. NMFS believes this choice will not reduce efficiency, is more practicable, and is more cost-effective. The final actions, accompanied by the VMS requirement previously implemented, allow the fishery to operate at the lowest possible cost (e.g., fishing effort, administration, and enforcement). With regard to NS 6, the final actions are flexible enough to be changed under the FMP framework to accommodate biological, social, and economic variability. NMFS will continue data collection programs with respect to this fishery in order to assess the effectiveness of the program. NMFS also considered the costs and benefits of this rulemaking in Sections 7, 8, and 9 and concluded that the benefits of these regulations are real and substantial relative to the added administrative, research, and enforcement costs, and the compliance costs to the industry (NS 7). Social impacts are discussed in Section 9. Consistent with NS 8, NMFS has considered the impacts of these actions on fishing communities. This rulemaking specifically addresses NS 9 by minimizing bycatch and bycatch mortality in the Atlantic pelagic longline fishery as described in Section 1. It further attempts to reduce the incidental catch in this fishery, including bluefin tuna, marine mammals, and sea birds. In terms of NS 10, the final regulations do not require fishermen to fish in an unsafe manner. However, there is concern that some fishermen may decide to fish farther offshore than is safe in their vessel. NMFS urges fishermen to use caution, but cannot control what individual fishermen do in response to the closed areas.

10.2 MITIGATING MEASURES

Most pelagic longline vessels affected by these regulations are likely to continue to derive their income predominantly from commercial fishing activities. Some vessel owners, however, might choose to exit all commercial fisheries as a result of this action, and might seek to be compensated for the residual value of their longline gear by selling their vessels and limited access permits. It is likely that participants could sell their swordfish, shark, and tuna longline category limited access permits to other interested fishermen (predominantly those fishermen in other geographic areas). Those fishermen with suitable vessels might shift to participate in recreational fisheries by converting to charter/headboat operations. In addition, the industry, with considerable constituent support, is pursuing a legislative buyback program which might mitigate economic impacts to vessels that actively fished with pelagic longline gear in the closed areas in recent years. Also, in order to give fishermen a chance to relocate their businesses and families, NMFS is delaying the implementation of the time/area closures by 90 days (DeSoto Canyon) and 180 days (Charleston Bump and East Florida Coast).

In an effort to reduce the social and economic impacts without reducing the conservation benefits of a western Gulf of Mexico closure, NMFS analyzed other options. NMFS expects that the final action to prohibit live bait in the Gulf of Mexico, as opposed to closing the western Gulf of Mexico, will mitigate some of the economic and social effects otherwise posed by the time/area closures while also achieving the conservation goals of the HMS FMP and Billfish FMP Amendment.

10.3 UNAVOIDABLE ADVERSE IMPACTS

The reasons for the final actions are outlined in the previous sections of this document. The final actions achieve the goals stated in Section 1 yet mitigate some of the economic and social impacts of the initially proposed actions. The NS Guidelines provide a list of factors that should be considered in determining whether a bycatch reduction measure is practicable:

1. Population effects for the incidental catch species;
2. Ecological effects due to changes in the incidental catch of the species (effects on other species in the ecosystem);
3. Changes in the incidental catch of other species of fish and the resulting population and ecosystem effects;
4. Effects on marine mammals and birds;
5. Changes in fishing, processing, disposal, and marketing costs;
6. Changes in fishing practices and behavior of fishermen;
7. Changes in research, administration, and management effectiveness;
8. Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources;
9. Changes in the distribution of benefits and costs; and,
10. Social effects.

NMFS considered all of these factors for each alternative and has determined that the final actions are indeed practicable. The final actions will result in bycatch and incidental catch reduction and increased revenues in the long-term through enhancing the rebuilding of overfished species. They were chosen because they meet the objectives of this rulemaking and mitigate to the extent possible the impacts on fishermen and communities. The adverse impacts as a result of the final actions are unavoidable.

10.4 LIST OF AGENCIES AND PERSONS CONSULTED

Discussions relevant to the formulation of the proposed and final actions involved input from several scientific and stakeholder groups: NMFS Southeast Fisheries Science Center, NMFS Office of Science and Technology, NMFS Office of Protected Resources, and the HMS and Billfish APs which includes representatives from the commercial fishing industries, recreational fishing industries, environmental organizations, state representatives, and fishery management councils. Members of the public submitted comments on a previously proposed time/area closure in writing and at 27 public hearings relevant to the proposed rule to implement the HMS

FMP.

Copies of the DSEIS and the proposed rule were sent to current Billfish and Highly Migratory Species AP members, HMS Consulting Parties, the U.S. Coast Guard, the Department of State, the ICCAT Advisory Committee chairman, and ICCAT Commissioners. Copies of the supplemental information and notice about the DeSoto Canyon were sent to all swordfish limited access permit holders and interested parties.

Members of the public and the APs had a further chance to submit comments at the two HMS and Billfish AP meetings held on this rule, during the two comment periods for this rule, and during the 13 public hearings held for this rulemaking. NMFS would like to thank the members of the public and the APs who participated in this rulemaking.

All these documents associated with the proposed and final rule can be obtained from the Highly Migratory Species Management Division, 1315 East-West Highway, F/SF1, Silver Spring, MD 20910.

10.5 LIST OF PREPARERS

This document was prepared by individuals from the Office of Sustainable Fisheries, Highly Migratory Species Management Division.

Karyl Brewster-Geisz (Fishery Management Specialist)
Rebecca Lent, Ph.D. (Chief, Highly Migratory Species Division)
Christopher Rogers, Ph.D. (Fishery Biologist)
Jill Stevenson, M.S. (Fishery Management Specialist)
Buck Sutter, M.S. (Fishery Management Specialist, Billfish Team Leader)

This division also received help from other Offices including the Office of Science and Technology, the Office of Protected Resources, the Southeast Regional Office, the Southeast Fisheries Science Center, and the National Oceanic Atmospheric Administration's General Counsel for Fisheries.

10.6 FINDING

The final actions described in this document will have a significant impact on the human environment. NMFS has determined through consideration of the following questions (NOAA Administrative order 216-6):

1. Are the final actions expected to jeopardize the sustainability of any target or non-target species that may be affected by the action? Or will the final actions have any cumulative adverse effects on target or non-target species?

As described in Section 1, the objectives of these regulations include reducing bycatch, bycatch

mortality, and the incidental catch of HMS, finfish, marine mammals, sea turtles, and sea birds by pelagic longline gear while minimizing the impact on the target species. Thus, NMFS does not believe that the final actions in these regulations will jeopardize the sustainability of any target or non-target species.

2. Will the final actions cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?

The final actions include time/area closures for fishing with pelagic longline gear. To the extent that this gear type may have harmed any habitats or marine life, these regulations will prevent further harm from occurring with this gear type.

3. Will the final actions cause substantial adverse impact on public health or safety?

To the extent that some fishermen may decide, as a result of the time/area closures, to fish beyond the safety limitations of their vessel, there could be some safety implications of these regulations. However, these regulations do not require fishermen to fish in an unsafe manner.

4. Will the final actions adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

The final actions could increase turtle interactions with pelagic longline gear. In November 1999, the Office of Sustainable Fisheries reinitiated consultation with the Office of Protected Resources. A draft BO from early June 2000 concluded that the continued use of pelagic longline gear could jeopardize the continued existence of loggerhead sea turtles. Pending further analyses, the final BO, expected in late June 2000, may include an additional jeopardy finding for leatherback turtles. NMFS will begin rulemaking to implement measures to reduce turtle interactions with pelagic longline gear once the final BO is issued.

The final actions are not expected to increase interactions with other protected species.

5. Will the final actions have a substantial impact on biodiversity and ecosystem function within the affected area?

The final actions are expected to enhance rebuilding of overfished HMS. To the extent that overfishing may have had an impact on ecosystem function and biodiversity, these regulations could help to repair any damage caused by the fishery.

11.0 REFERENCES

Note: All references can be obtained by contacting the Office of Sustainable Fisheries, Highly Migratory Species Management Division, 1315 East-West Highway, Silver Spring, MD 20910.

- Aguilar, R., J. Mas, and X. Pastor. 1992. Impact of Spanish swordfish longline fisheries on loggerhead sea turtle, *Caretta caretta*, population in the western Mediterranean. U.S. Department of Commerce. NOAA Tech. Memo. NMFS-SEFSC-361: 1-6.
- Alexander, K., G. Robertson, R. Gales. 1997. The incidental mortality of Albatrosses in longline fisheries. A Report on the Workshop from the First International Conference on the Biology and Conservation of Albatrosses. Hobart, Australia, September 1995. 44 pp.
- Alverson, D.L., M.H. Freeberg, S.A. Murawski, and J.G. Pope. 1994. A global assessment of fisheries bycatch and discards. Food and Agriculture Organization Fisheries Technical Paper No. 339, Rome, Italy, FAO. 233 pp.
- Angliss, R.P., and D.P. DeMaster. 1998. Differentiating serious and non-serious injury of marine mammals taken incidental to commercial fishing operations: report of the serious injury workshop 1-2 April 1997, Silver Spring, Maryland. U.S. Department of Commerce. NOAA Tech. memo. NMFS-OPR-13, 48 pp.
- Arocha, F. 1997. The reproductive dynamics of swordfish *Xiphias gladius* L. and management implications in the northwestern Atlantic. University of Miami, Ph.D. Dissertation. Coral Gables, FL. 383 pp.
- Balazs, G.H. NMFS, Honolulu, HI., personal communication.
- Berkeley, S.A. and R.E. Edwards. 1997. Factors affecting billfish capture and survival in longline fisheries: Potential application for reducing bycatch mortality. SCRS/97/63.
- Bjorndal, K.A., A.B. Bolten, and B. Riewald. 1999. Development and use of satellite telemetry to estimate post-hooking mortality of marine turtles in the pelagic longline fisheries. U.S. Department of Commerce. NMFS SWFSC Admin. Rep. H-99-03C, 25 p.
- Brown, C.A., J. Cramer, and A. Bertolino. In press. Estimates of bycatch by the U.S. Atlantic pelagic longline fleet during 1993-1998. Proceedings of the Sixth National Stock Assessment Workshop, March 28-30, 2000. U.S. Department of Commerce. NOAA Tech. Memo NMFS-NWFSC.
- Chakravorty, U. and K. Nemoto. 2000. Modeling the effects of area closure and tax policies: a spatial model of the Hawaii longline fishery. SOEST 00-02, JIMAR Contribution 00-329, 28 pp.

- Cramer, J. 1996. Large pelagic logbook newsletter: 1995. NOAA Technical Memorandum NMFS-SEFSC-394. 28pp.
- Cramer, J. 1999. Pelagic longline bycatch. ICCAT Working Document SCRS/99, July, 1999.
- Cramer, J. and H. Adams. 2000. Large pelagic logbook newsletter:1998. NOAA Tech. Memo. NMFS-SEFSC-433. 25 pp.
- Cramer, J., A.R. Bertolino, and G.P. Scott. 1997. Estimates of recent shark bycatch by U.S. vessels fishing for Atlantic tuna and tuna-like species. SCRS/97/58.
- Cramer, J. and G. Scott. 1998. Summarization of catch and effort in the pelagic longline fishery and analysis of the effect of two degree square closures on swordfish and discards landings. Sustainable Fisheries Division Contribution MIA-97/98-17. 22 pp.
- Curtis, Rita. 1999. Welfare effects of sea turtle preservation in the Hawaii longline fishery. Working Paper. Silver Spring, MD.
- Ditton, R.B. and D.J. Clark. 1994. Characteristics, attitudes, catch and release behavior, and expenditures of billfish tournament anglers in Puerto Rico. Report prepared for The Billfish Foundation, Ft. Lauderdale, FL. 27pp.
- Ditton, R.B. and J.R. Stoll. 1998. A socio-economic review of recreational billfish fisheries. Texas A&M University and University of Wisconsin-Green Bay, Green Bay, WI.
- Falterman, B. and J. Graves. 1999. A comparison of the relative mortality and hooking efficiency of circle and straight shank ("J") hooks used in the pelagic longline industry. Report to NMFS. 12 pp.
- Fisher, M.R. and R.B. Ditton. 1992. Characteristics of billfish anglers in the U.S. Atlantic Ocean. Marine Fisheries Review 54(1): 1-6.
- Florida Association of Realtors. Florida. Personal communication.
- Gauvin, J. 1990. Estimation of supply and demand functions for broadbill swordfish in the United States. Draft report, SAFMC, Charleston, SC, January 1990. 14 pp.
- Goodyear, C. P. 1998. An analysis of the possible utility of time-area closures to minimize billfish bycatch by U.S. pelagic longlines. Fish. Bull. 97:243-255.
- GMFMC. 1996. Amendment 8 to the fishery management plan for coastal migratory pelagic resources in the Gulf of Mexico and South Atlantic. GMFMC/SAFMC, August 1996. 100 pp.

- Heppell, S.S., D.T. Crouse, L.B. Crowder, S.P. Epperly, and N.B. Frazer. In preparation. Population models for Atlantic loggerheads: past, present and future. In: A. Bolten and B. Witherington, eds. Ecology and Conservation of Loggerhead Sea Turtles, Univ. Florida Press (presented at special loggerhead symposium in Orlando, Florida, March 2000).
- Hoey, J. 1996. NEFSC pelagic longline data review and analysis of gear, environmental, and operating practices that influence pelagic longline interactions with sea turtles. Final Contract Report, NOAA Contract - 50EANA700063. 32 pp.
- Hoey, J. 1998. Analysis of gear, environmental, and operating practices that influence pelagic longline interactions with sea turtles. Final report No. 50EANA700063 to the Northeast Regional Office, Gloucester, MA. 32 pp.
- Hoey, J. and N. Moore. 1999. Captain's report: Multi-species catch characteristics for the U.S. Atlantic pelagic longline fishery. August 1999. 78 pp.
- Johnson, D.R., C. Yeung, and C.A. Brown. 1999. Estimates of marine mammal and marine turtle bycatch by the U.S. Atlantic pelagic longline fleet in 1992-1997. U.S. Dep. Commerce. NOAA Tech. Memo. NMFS-SEFSC-418, 70 pp.
- Kleiber, P., C. Boggs, and J. Weatherall. In prep. Workshop on reducing sea turtle takes in longline fisheries. U.S. Department of Commerce. NOAA Tech. Memo. NMFS-SWFSC.
- Larkin, S.L., D.J. Lee, C.M. Adams. 1998. Costs, earnings, and returns to the U.S. Atlantic longline pelagic longline fleet in 1996. Staff Paper Series SP 98-9. University of Florida, Institute of Food and Agricultural Sciences, Food and Resource Economics Department. Gainesville, FL. 46 pp.
- Lee, D. NMFS, Southeast Fisheries Science Center, Miami, FL, personal communication.
- Louisiana Population Data Center. 1998. MARFIN Socio-Demographic Database. Baton Rouge, LA.
- Mace, P. NMFS, Science and Technology, Woods Hole, MA, personal communication.
- NMFS. 1999a. Fisheries of the United States, 1998. U.S. Department of Commerce. Silver Spring, MD. 130pp.
- NMFS. 1999b. Our Living Oceans. Report on the status of U.S. living marine resources, 1999. NOAA Tech. Memo. NMFS-F/SPO-41.
- NMFS. 1999c. National report of the United States: 1999, ICCAT Working Document, SCRS/99/95. 94 pp.

- NMFS. 1999d. Endangered Species Act Section 7 consultation of fishery management plan for Atlantic tunas, swordfish, and sharks. Silver Spring, MD. April 23, 1999.
- NMFS. 2000. Stock assessment and fishery evaluation for Atlantic highly migratory species. Silver Spring, MD. 184 pp.
- NMFS. 2000b. Draft Endangered Species Act Section 7 consultation of fishery management plan for Atlantic tunas, swordfish, and sharks. Silver Spring, MD. Draft as of June 7, 2000.
- Orsi, J.A., A.C. Wertheimer, H.W. Jaenicke. 1993. Influence of selected hook and lure types on catch, size, and mortality of commercially troll-caught chinook salmon. *N. Am. J. Fish. Manage.* 13, 709-722.
- Pepperell, J. 1999. Trends in istiophorid billfish catches off Eastern Australia and New Zealand: Recreational and commercial comparisons. *Proceedings of the 50th Annual Tuna Conference*, Lake Arrowhead, CA, May 24-27, 1999.
- Polovina, J.J., D.R. Kobayashi, D.M. Ellis, M.P. Seki, and G.H. Balazs. 1999. In press. Turtles on the edge: movement of loggerhead turtles (*Caretta caretta*) along oceanic fronts, spanning longline fishing grounds in the central North Pacific, 1997-1998. *Fisheries Oceanography*.
- Price, T.D. 1995. Observed sea turtle interactions - Hawaii longline fishery (February 27, 1994 - February 20, 1995). In: G.H. Balazs, S.G. Pooley, and S.K.K. Murakawa (eds.). *Guidelines for handling marine turtles hooked or entangled in the Hawaii longline fishery: Results of an expert workshop held in Honolulu, Hawaii March 15-17, 1995*. NOAA Tech. Mem., NOAA-TM-NMFS-SWFSC-222, 41 pp.
- Prince, E.P., M. Ortiz, and A. Venizelos. 1999. Billfish and circle hooks. *National Symposium on Catch and Release in Marine Recreational Fisheries*. December 5-8, 1999. Virginia Beach, VA.
- SAFMC. 1990. Amendment I to the fishery management plan for Atlantic Swordfish, Charleston, SC, October 1990. 101 pp.
- Scott, G.P. and C.A. Brown. 1997. Estimates of marine mammal and marine turtle catch by the U.S. pelagic longline fleet in 1994-1995. U.S. Department of Commerce. NMFS SEFSC Tech. Rep. MIA-96/97-28, 14 p.
- Scott, G.P., C. Brown, and J. Cramer. 2000. Live bait vs dead bait evaluations of U.S. pelagic longline fishing incidental catch rates of billfish in the Gulf of Mexico. NOAA Fisheries, SEFSC, Sustainable Fisheries Division Contribution SFD-99/00-88.

- SCRS. 1996. Report of the Third ICCAT Billfish Workshop. International Commission for the Conservation of Atlantic Tunas, Miami, Florida, USA. July 11-20, 1996. COM-SCRS/96/19.
- SCRS. 1998. Report of the Standing Committee on Research and Statistics (SCRS). International Commission for the Conservation of Atlantic Tunas. Madrid, Spain. October 1998. COM/98/16.
- SCRS. 1999. Report of the Standing Committee on Research and Statistics, 16th Regular Meeting of the Commission, Executive Summary, October 12, 1999.
- Skillman and Kleiber. 1998. Estimation of sea turtle take and mortality in the Hawaii-based longline fishery, 1994-96. NOAA Technical Memorandum. NMFS-SWRSC-257. 52pp.
- Strand, I., McConnell, K., Bockstael, N. 1994. Commercial fisheries harvesting, conservation and pollution: preferences and conflicts. Final Report, NMFS Contract NA-26FD-0135-01, National Saltonstall-Kennedy Program.
- Strand, I. and J. Mistiean. 1999. Annual Report (1998-1999): An analysis of longline vessel movement in the Atlantic, Gulf of Mexico, and the Caribbean. 23 pp.
- Thunberg, E. and J.L. Seale. 1992. Economic analysis of swordfish management policy on swordfish and tuna fisheries in the Gulf of Mexico. Final project report, MARFIN, Dept. of Food and Resource Economics, University of Florida. Gainesville, FL.
- Ulloa Ramirez, P.A. and L.V. Gonzalez Ania. In press. Incidence of marine turtles in the Mexican long-line tuna fishery in the Gulf of Mexico. U.S. Department of Commerce. NOAA Tech. Memo. NMFS-SEFSC.
- U.S. Census Bureau. 1999. Population estimates for states by race and Hispanic origin: July 1, 1998. Population estimates program. Population Division. Washington, D.C.
- Wang, J.H., K.J. Lohmann, L.C. Boles, W.P. Irwin. 2000. Responses of pelagic-stage loggerhead sea turtles to light sticks used in longline fisheries. In Proceedings of the Eighteenth Sea Turtle Symposium, Orlando, Fla. (In prep).
- Ward, J. and E. Hanson. 1999. The regulatory flexibility act and HMS management data needs. Presentation at the American Fisheries Society Annual Meeting. Charlotte, North Carolina.
- Wilson, D., B.J. McCay, D. Estler, M. Perez-Lugo, J. LaMarque, S. Seminski, A. Tomczuk. 1998. Social and cultural impact assessment of the Highly Migratory Species Fishery Management Plan and the Amendment to the Atlantic Billfish Fisheries Management Plan, NOAA-NMFS-HMS Contract. 178 pp.

- Witzell, W.N. 1999. Distribution and relative abundance of sea turtles caught incidentally by the U.S. pelagic longline fleet in the western North Atlantic Ocean, 1992-1995. Fisheries Bulletin. 97:200-211.
- Witzell, W.N. and J. Cramer. 1995. Estimates of sea turtle bycatch by the U.S. longline fleet in the Western North Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-359. 18pp.
- Yeung, C. 1999. Estimates of marine mammal and marine turtle bycatch by the U.S. Atlantic pelagic longline fleet in 1998. U.S. Department of Commerce. NOAA Tech. Memo. NMFS-SEFSC-430. 26pp.
- Yeung, C., S. Epperly, and C. Brown. 2000. Preliminary revised estimates of marine mammal and marine turtle bycatch by the U.S. Atlantic pelagic longline fleet, 1992-1998. U.S. Department of Commerce., NMFS, SEFSC PRD Contribution No.99/00-13.

10.0	OTHER CONSIDERATIONS	10-1
10.1	Consideration of Magnuson-Stevens Act Section 304 (g) Measures and National Standards	10-1
10.1.1	Evaluation of Possible Disadvantage to U.S. Fishermen in Relation to Foreign Competitors	10-1
10.1.2	Provide U.S. Fishing Vessels Reasonable Opportunity to Harvest Quota	10-1
10.1.3	Pursue Comparable International Fishery Management Measures ...	10-2
10.1.4	Consider Traditional Fishing Patterns and the Operating Requirements of the Fisheries	10-2
10.1.5	National Standards	10-3
10.2	MITIGATING MEASURES	10-4
10.3	UNAVOIDABLE ADVERSE IMPACTS	10-5
10.4	LIST OF AGENCIES AND PERSONS CONSULTED	10-5
10.5	LIST OF PREPARERS	10-6
10.6	FINDING	10-6
11.0	REFERENCES	11-1

Figure 10.1. Average distribution of swordfish catch (landings + discards, in number of fish) from 1991-1998. Proportion of fish less than 125 cm lower jaw fork length is the lightly shaded area. 10-3